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Janosik et al.

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(54) **COLLAPSIBLE WIRE CARRIER**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 280 days.

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(22) Filed: **Dec. 20, 2012**

(65) **Prior Publication Data**

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(51) **Int. Cl.**

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B65H 75/20	(2006.01)
B65H 75/22	(2006.01)
B65H 7/20	(2006.01)

(52) **U.S. Cl.**

CPC ***B65H 75/22*** (2013.01); ***B65H 7/20*** (2013.01); ***B65H 75/12*** (2013.01); *B65H 2701/36* (2013.01)

(58) **Field of Classification Search**

CPC B65H 75/12; B65H 75/20; B65H 75/22
USPC 242/604, 604.1, 118.1, 607, 608, 608.4, 242/608.5, 609.2, 609.3, 407.1
See application file for complete search history.

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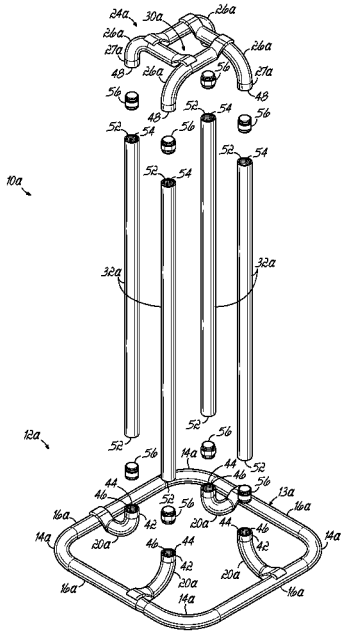
(74) *Attorney, Agent, or Firm* — Wood, Herron & Evans, LLP

(57) **ABSTRACT**

A collapsible wire carrier (**10**) includes a base (**12**) and a top (**24**) spaced from each other with a plurality of tubular legs (**32**). The legs (**32**) are secured to the base (**12**) and the top (**24**) with connectors (**36**) using fasteners (**40**). Each leg (**32**) has openings (**34**) at each end which, upon assembly, are aligned with openings (**38**) in connectors (**36**) and secured thereto with fasteners (**40**). Four connectors (**36**) fit inside portions of the base (**12**) and inside portions of the legs (**32**). Four other connectors (**36**) fit inside portions of the top (**24**) and inside portions of the legs (**32**).

18 Claims, 6 Drawing Sheets



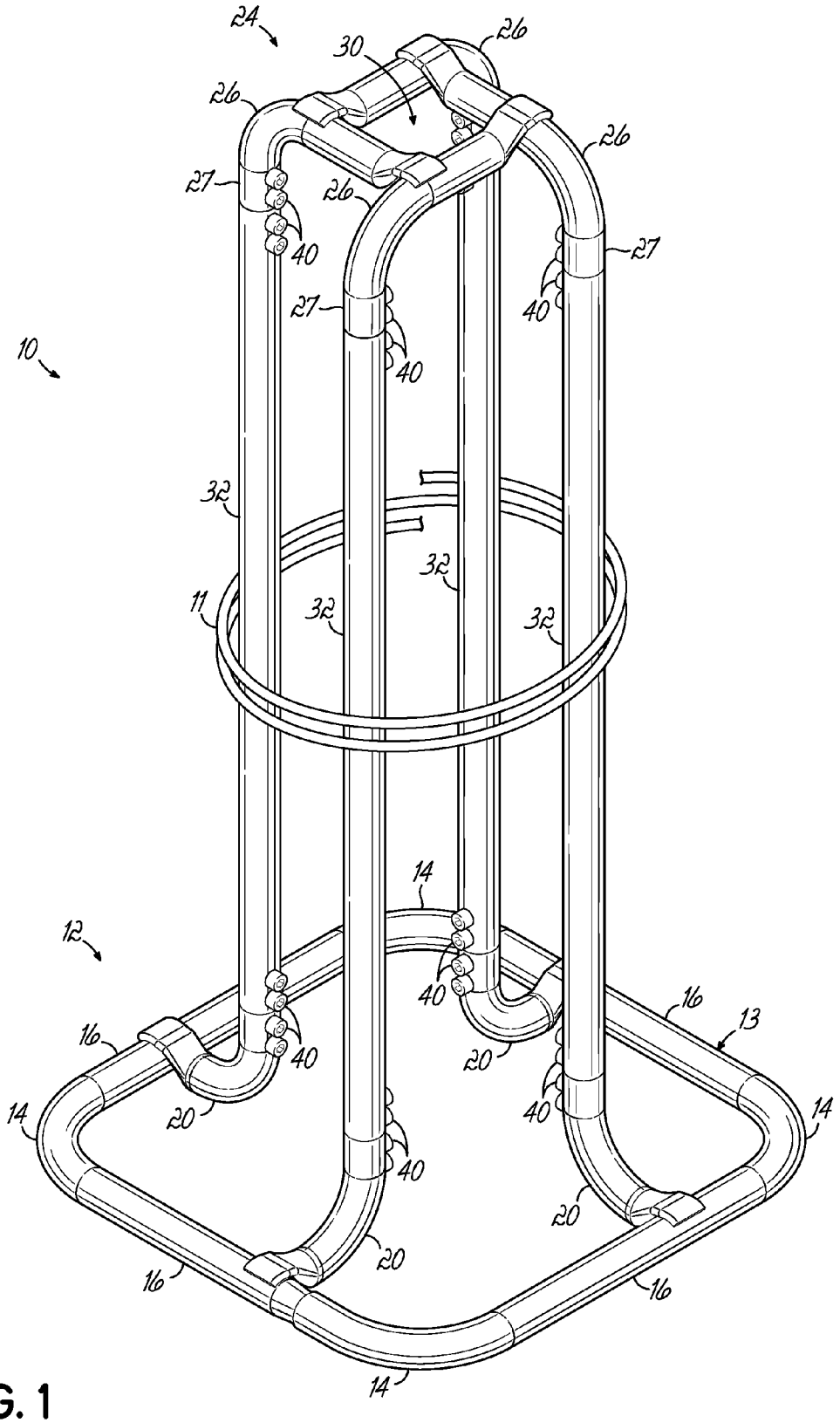

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FIG. 1

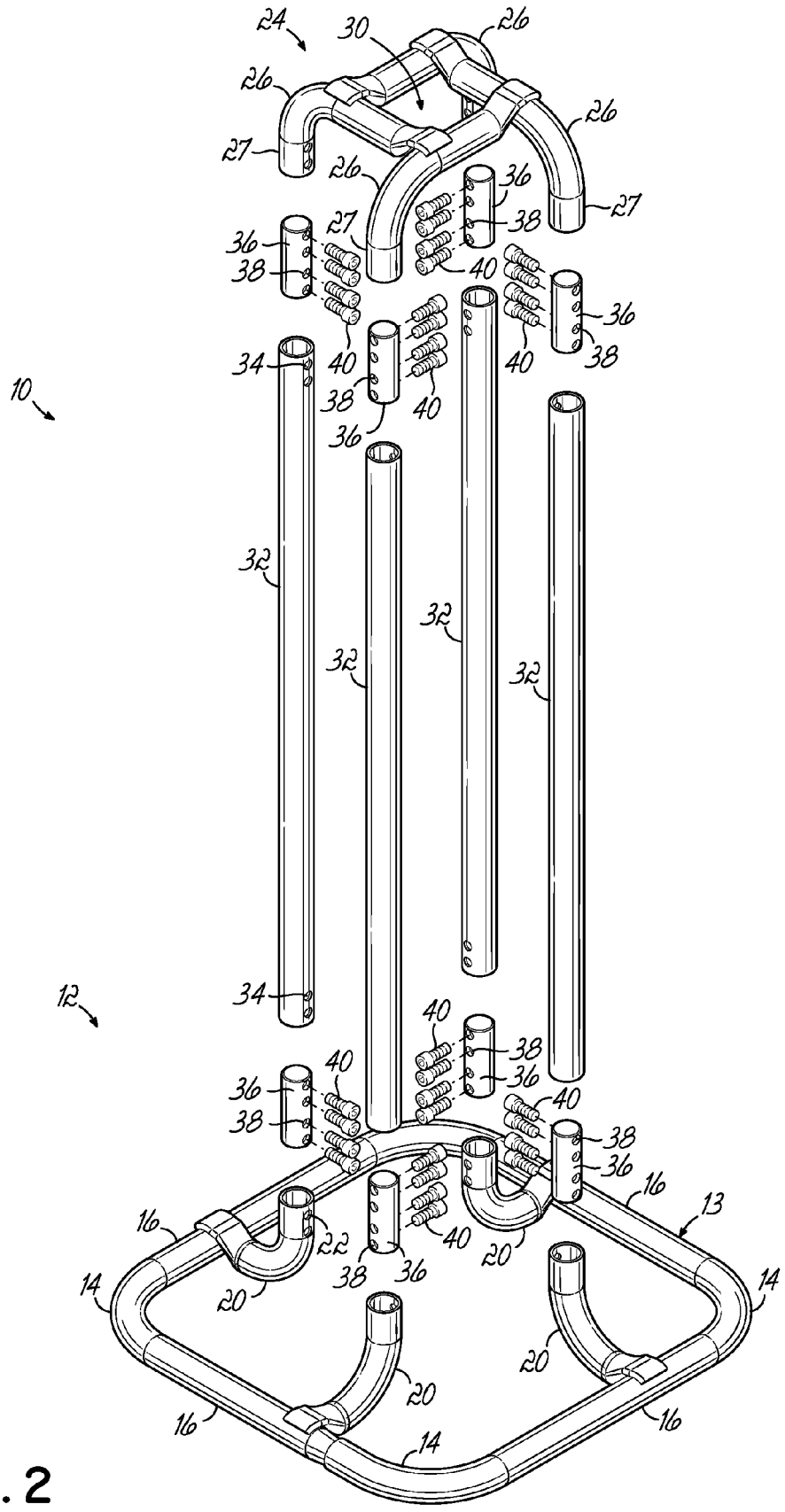
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FIG. 2

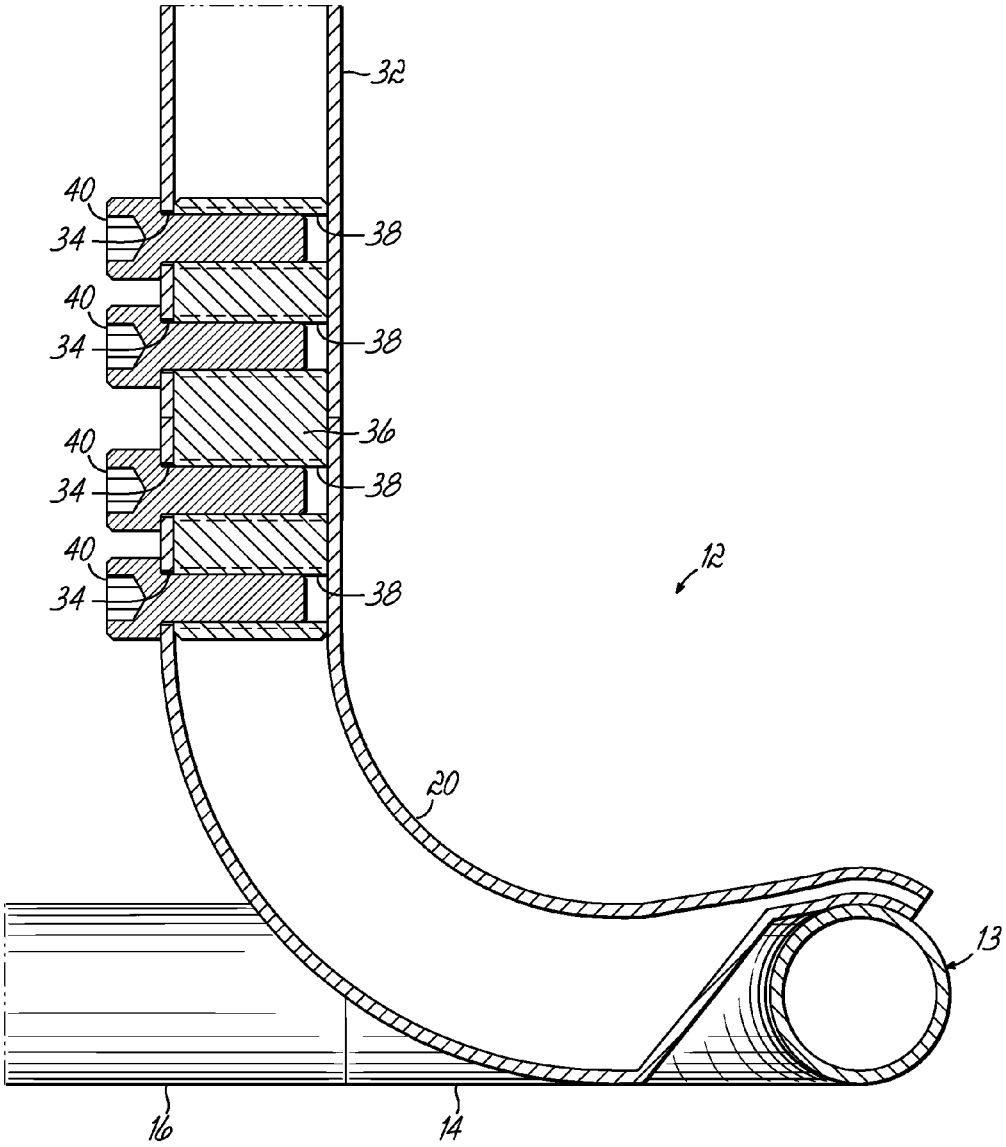

FIG. 3

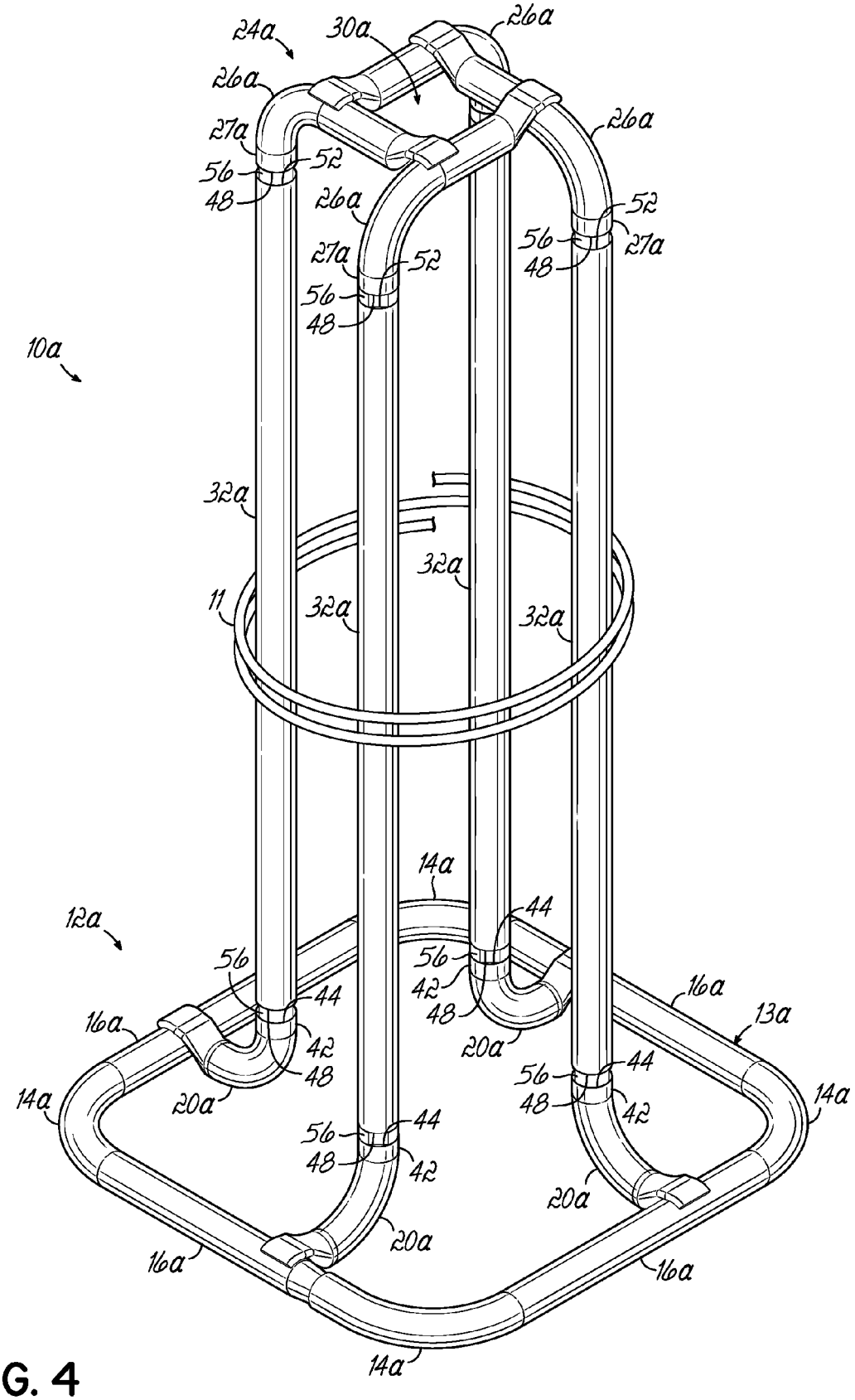
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FIG. 4

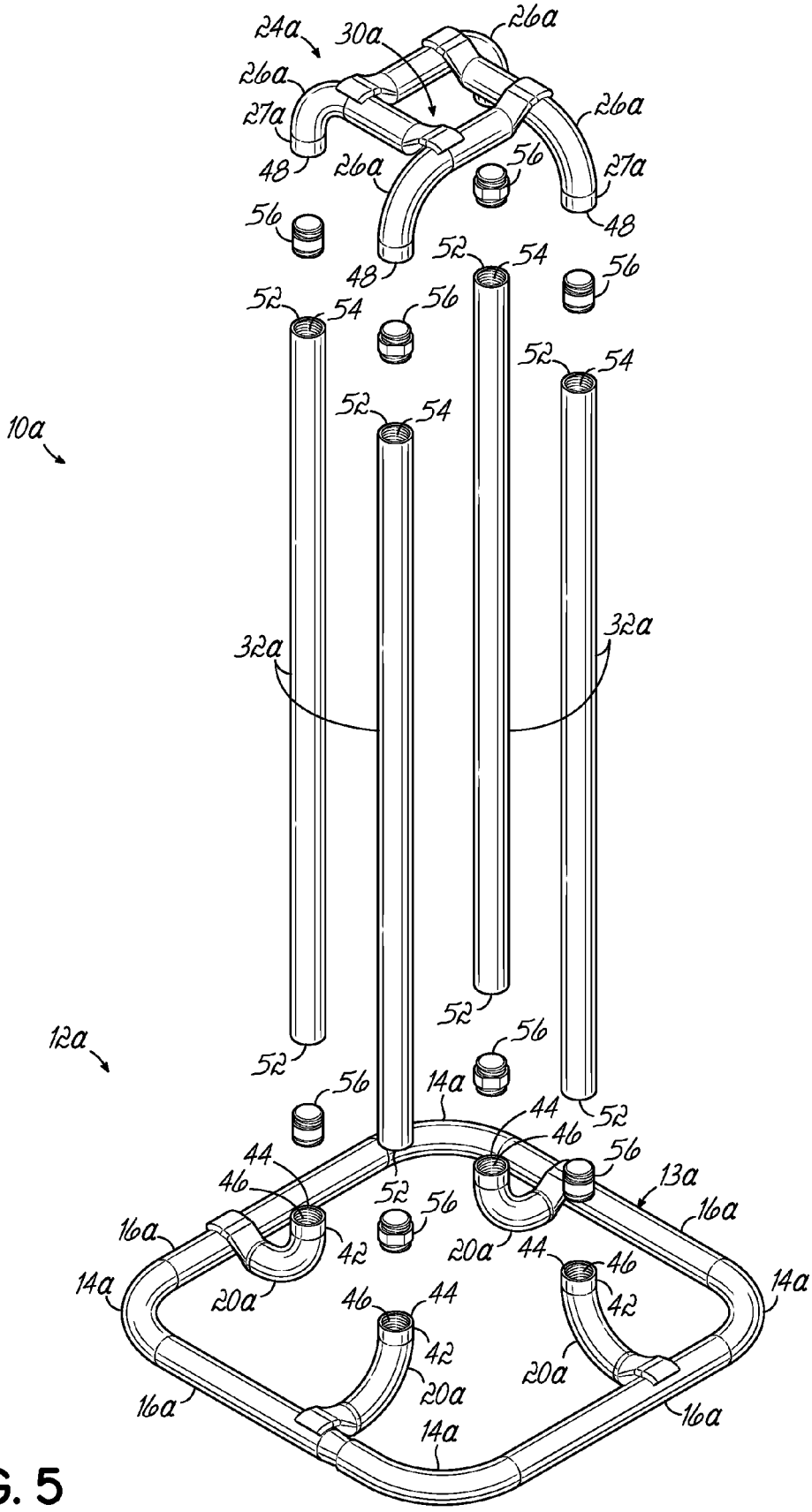

FIG. 5

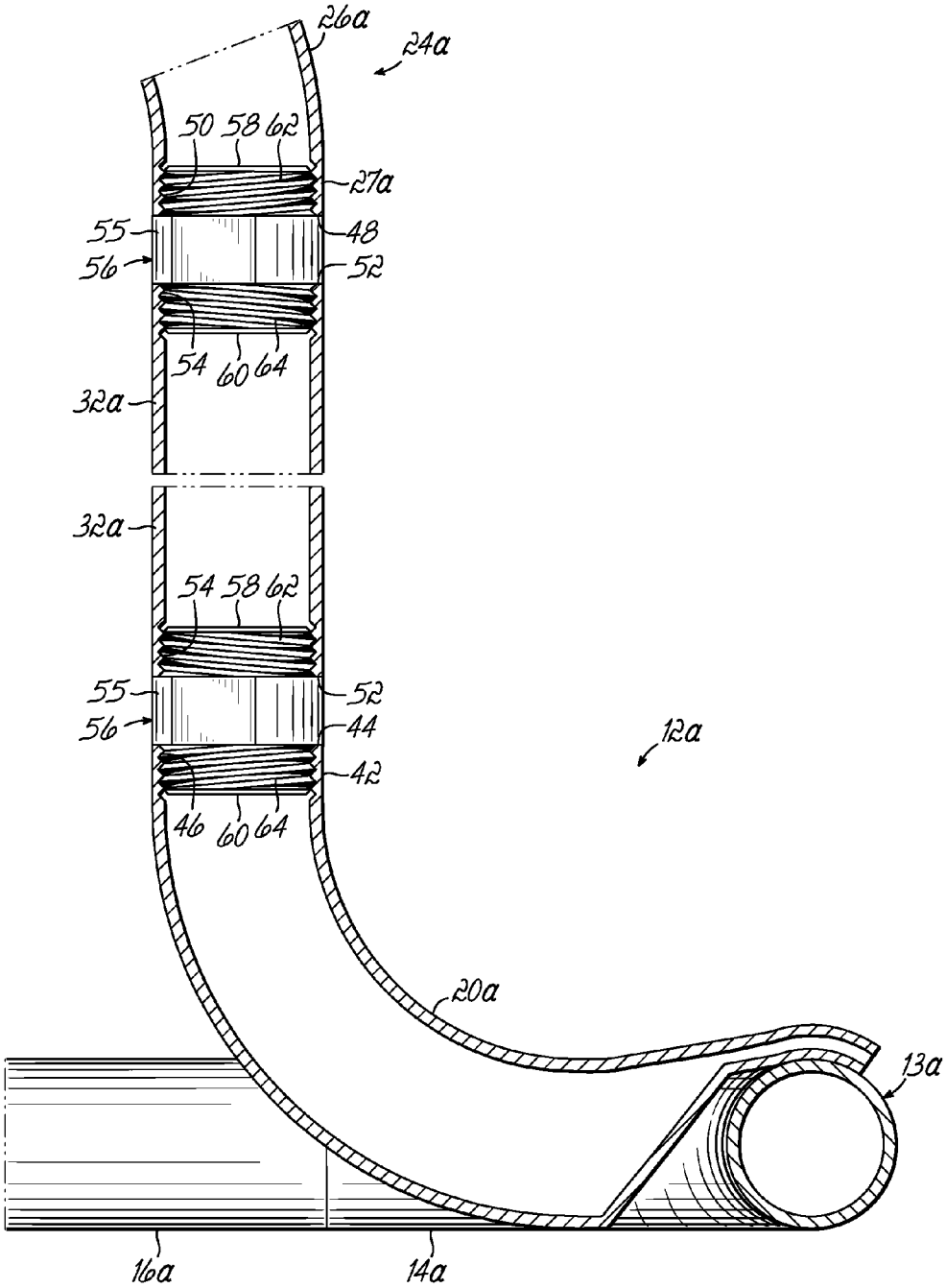
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FIG. 6

COLLAPSIBLE WIRE CARRIER

FIELD OF THE INVENTION

This invention relates generally to wire carriers and, more particularly, to collapsible wire carriers for use in winding and unwinding, transporting and storing coils of wire.

BACKGROUND OF THE INVENTION

A conventional carrier for a coil of wire consists of a plurality of vertically positioned rods or tubes in spaced relation on a disc-shaped base. The rods or tubes are joined to the base and at the top of the carrier to one another by welding. Wire carriers of this type are completed at a fabricating plant, and stacked together by nesting for storing and shipping. While a number of these carriers may be nested to form a relatively compact unit or package, the nested packages are difficult to handle and store. In order to be stored or shipped, they require an excessive amount of space, thus increasing the cost of shipping and storage. Further, this type of carrier is necessarily made relatively heavy and bulky in order to obtain the requisite amount of strength, particularly in the disc base.

U.S. Pat. No. 3,186,658 discloses a tubular collapsible wire carrier. However, this collapsible wire carrier has a "four leaf clover" base which may easily become caught on objects in a factory and cause damage. Furthermore, even when collapsed, the pieces of this collapsible wire carrier are relatively large and bulky and may be difficult to transport. If a forklift damages one of the legs of this collapsible wire carrier, at least two legs must be replaced.

Thus, there is a need for a tubular collapsible wire carrier which has legs which may be individually replaced if damaged.

There is further a need for a tubular collapsible wire carrier which may be broken down in more pieces than known collapsible wire carriers.

SUMMARY OF THE INVENTION

This invention comprises a collapsible wire carrier for storing and shipping wire. One embodiment of collapsible wire carrier comprises a base, a top and multiple legs, each leg being removably secured to the base and top of the carrier. The base may include multiple base extensions welded or otherwise secured to a generally rectangular base bottom. In one embodiment, each of the legs is tubular. The top, base and each of the legs may have multiple openings therein through which fasteners pass. The collapsible wire carrier may further comprise multiple connectors for joining the legs to the base and top, each of the connectors joining one of the legs to one of the base and top. In one embodiment, each of the connectors fits inside a portion of one of the legs. The collapsible wire carrier further comprises fasteners for removably securing the connectors to the legs, top and base. Each of the fasteners extends through one of the openings in one of the base, top and legs and into a passage in one of the connectors.

According to another aspect of this invention, the collapsible wire carrier comprises a base, a top and multiple legs. In this embodiment, the top, base and each of the legs has threaded ends therein for receiving connectors. The collapsible wire carrier further comprises multiple connectors for joining the legs to the base and top. Four of the connectors join the legs to the base and four other connectors join the legs to the top. Each of the connectors has threaded ends for engaging the legs of the collapsible wire carrier. Each of the connectors thus removably secures the legs to one of the top and base.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of one embodiment of collapsible wire carrier in an assembled condition;

FIG. **2** is a partially disassembled view of the collapsible wire carrier of FIG. **1**;

FIG. **3** is an enlarged cross-sectional view of a portion of the collapsible wire carrier of FIGS. **1** and **2**;

FIG. **4** is a perspective view of another embodiment of collapsible wire carrier in an assembled condition;

FIG. **5** is a partially disassembled view of the collapsible wire carrier of FIG. **4**; and

FIG. **6** is an enlarged cross-sectional view of a portion of the collapsible wire carrier of FIGS. **4** and **5**.

DETAILED DESCRIPTION OF THE DRAWINGS

Referring to the drawings, and particularly to FIG. **1**, there is illustrated a collapsible wire carrier **10** for storing and transporting wire **11**. The collapsible wire carrier **10** comprises a base **12** having a generally rectangular base bottom **13** comprising four corner pieces **14** and four straight side pieces **16** (only one being shown per side in FIG. **1**). Although the base bottom **13** shown in FIG. **1** shows each of the sides **18** of the base bottom **13** being approximately the same length, they may be any desired lengths. The drawings are not intended to be limiting. Each of the pieces **14**, **16** of base **12** may be tubular and sized to fit together when assembled.

As best shown in FIG. **2**, the base **12** of collapsible wire carrier **10** further comprises a plurality of tubular base extensions **20** secured to the side pieces **16** of the base bottom **13**, such as by welding. Each of the base extensions **20** is arched or bowed upwardly and inwardly towards the center of the base bottom **13**. As shown in FIG. **2**, two circular openings **22** are located at an upper portion of each of the tubular base extensions **20**. These openings **22** are directed inwardly towards the center of the base bottom **13**. Although the openings **22** are shown having a certain circular configuration, they may be other sizes or shapes. Although two openings **22** are illustrated extending through the wall of the upper portion of each tubular base extension **20**, any number of openings may be present.

As best shown in FIG. **2**, collapsible wire carrier **10** further comprises a top **24** comprising four top members **26** welded together. Each of the top members **26** may be tubular and have a downwardly turned lower portion **27** having two openings **28** extending through the tube wall. These openings **28** are directed inwardly towards the center of the top **24**. Although the openings **28** are shown having a certain circular configuration, they may be other sizes or shapes. Although two openings **28** are illustrated extending through the wall of the lower portion **27** of each tubular top member **26**, any number of openings may be present. Each of the top members **26** is welded to one of the other top members **26** to create a rectangular opening **30** in the top **24**, as shown in FIGS. **1** and **2**.

As best shown in FIG. **2**, collapsible wire carrier **10** further comprises four straight tubular legs **32**. Each leg **32** has at each end two openings **34** extending through the tube wall. These openings **34** are directed inwardly towards the center of the collapsible wire carrier **10**. Although the openings **34** are shown having a certain circular configuration, they may be other sizes or shapes. Although two openings **34** are illustrated extending through the wall of each tubular leg **32** at

each end of the leg **32**, any number of openings may be present at each end of each leg **32**.

As best shown in FIG. **2**, collapsible wire carrier **10** further comprises eight connectors **36**. Four of the connectors **36** join upper portions of the legs **32** to the top **24** of the collapsible wire carrier **10** and, particularly, to the downwardly turned portions **27** of the top members **26**. Four other of the connectors **36** join lower portions of the legs **32** to the base **12** of the collapsible wire carrier **10** and, particularly, to the tubular base extensions **20** of base **12**.

As shown in FIG. **3**, each of the connectors **36** is a solid metallic piece having four aligned threaded openings **38** therein. Each of the threaded openings **38** is sized and adapted to receive a threaded fastener **40**. Although the fasteners **40** are illustrated as being set screws, they may be any other conventional fasteners.

As shown in FIG. **2**, each of the four connectors **36** used to join the base **12** to the legs **32** fits partially inside one of the base extensions **20** and partially inside a lower portion of one of the legs **32**. The lower two openings **38** of each of these four connectors **36** align with the two openings **22** of one of the base extensions **20** so that two fasteners **40** may extend through two of the openings **22** of a base extension **20** and extend into the two of the openings **38** of a connector **36**. Similarly, the upper two openings **38** of each of these four connectors **36** align with the two openings **34** of one of the legs **32** so that two fasteners **40** may extend through the openings **34** of a leg **32** and extend into the two of the openings **38** of a connector **36**. The four connectors **36** thus join the legs **32** to the base **12** of the collapsible wire carrier **10** in a manner which is quick and easy.

As shown in FIG. **2**, each of the four connectors **36** used to join the top **24** to the legs **32** fits partially inside one of the downwardly turned lower portion **27** of one of the top members **26** and partially inside an upper portion of one of the legs **32**. The upper two openings **38** of each of these four connectors **36** align with the two openings **22** of one of the downwardly turned lower portion **27** of one of the top members **26** so that two fasteners **40** may extend through the openings **28** of a downwardly turned lower portion **27** of one of the top members **26** and extend into the two of the openings **38** of a connector **36**. Similarly, the lower two openings **38** of each of these four connectors **36** align with the two openings **34** of one of the legs **32** so that two fasteners **40** may extend through the openings **34** of a leg **34** and extend into the two of the openings **38** of a connector **36**. The four connectors **36** thus join the legs **32** to the top **24** of the collapsible wire carrier **10** in a manner which is quick and easy.

FIGS. **4-6** illustrate an alternative embodiment of collapsible wire carrier **10***a* for storing and transporting wire **11**. The collapsible wire carrier **10***a* comprises a base **12***a* having a generally rectangular base bottom **13***a* comprising four corner pieces **14***a* and four straight side pieces **16***a* (only one being shown per side in FIG. **4**). Although the base **12***a* shown in FIG. **4** shows each of the sides **16***a* of the base bottom **13***a* being approximately the same length, they may be any desired lengths. The drawings are not intended to be limiting. Each of the pieces **14***a* , **16***a* of base bottom **13***a* may be tubular and sized to fit together when assembled.

As best shown in FIG. **5**, collapsible wire carrier **10***a* further comprises a plurality of tubular base extensions **20***a* secured to the side pieces **16***a* of the base **12***a* such as by welding. Each of the base extensions **20***a* is arched or bowed upwardly and inwardly towards the center of the base bottom **13***a* . As shown in FIG. **5**, an upper portion **42** of each base extension **20***a* has a threaded opening **44** comprising internal threads **46**. These internal threads **46** are either right or left handed threads for mating with corresponding external threads of one of the connectors in a manner described below.

As best shown in FIG. **5**, collapsible wire carrier **10***a* further comprises a top **24***a* comprising four top members **26***a* welded together. Each of the top members **26***a* may be tubular and have a downwardly turned lower portion **27***a* having a threaded opening **48** comprising internal threads **50**. The internal threads **50** are either right or left handed threads for mating with corresponding external threads of one of the connectors in a manner described below. Each of the top members **26***a* is welded to one of the other top members **26***a* to create a rectangular opening **30***a* in the top **24***a* , as shown in FIGS. **4** and **5**.

As best shown in FIG. **5**, collapsible wire carrier **10***a* further comprises four straight tubular legs **32***a* . Each leg **32***a* has at each end a threaded opening **52** comprising internal threads **54**. The internal threads **54** are either right or left handed threads for mating with corresponding external threads of one of the connectors in a manner described below.

As best shown in FIG. **5**, collapsible wire carrier **10***a* further comprises eight connectors **56**. Four of the connectors **56** join upper portions of the legs **32***a* to the top **24***a* of the collapsible wire carrier **10***a* and, particularly, to the downwardly turned portions **27***a* of the top members **26***a* . Four other of the connectors **56** join lower portions of the legs **32***a* to the base **12***a* of the collapsible wire carrier **10***a* and, particularly, to the tubular base extensions **20***a* of base **12***a*.

As shown in FIGS. **5** and **6**, each of the connectors **56** is a solid metallic piece having a middle non-threaded portion **55** and first and second threaded ends **58**, **60**, respectively. Each of the upper or first threaded ends **58** has external threads **62** sized and adapted to mate with the internal threads **54** of the legs **32***a* or the internal threads **46** of a base extension **20***a* or the internal threads **50** of a top member **26***a*.

As shown in FIG. **6**, each of the four connectors **56** used to join the base **12***a* to the legs **32***a* fits partially inside one of the base extensions **20***a* and partially inside a lower portion of one of the legs **32***a* . The first or upper portion **58** of the connector **56** is threaded into the threaded opening **52** of one of the legs **32***a* . Similarly, second or lower portion **60** of the connector **56** is threaded into the threaded opening **44** of an upper portion **42** of a base extension **20***a* . The four connectors **56** thus join the legs **32***a* to the base **12***a* of the collapsible wire carrier **10** in a manner which is quick and easy.

As shown in FIG. **6**, each of the four connectors **56** used to join the top **24***a* to the legs **32***a* fits partially inside one of the downwardly turned lower portions **27***a* of one of the top members **26***a* and partially inside an upper portion of one of the legs **32***a* . The first or upper portion **58** of the connector **56** is threaded into the threaded opening **48** of one of the downwardly turned portions **27***a* of the top members **26***a* . Similarly, second or lower portion **60** of the connector **56** is threaded into the threaded opening **52** of one of the legs **32***a* . The four connectors **36** thus join the legs **32***a* to the top **24***a* of the collapsible wire carrier **10***a* in a manner which is quick and easy.

Although the connectors are shown having a certain cross-sectional configuration, they may be other sizes or shapes. Similarly, the openings in the pieces of the collapsible wire carrier may be any desired shapes or sizes. Although we have described several embodiments of the invention, we do not intend to be limited except by the scope of the following claims.

We claim:

1. A collapsible wire carrier comprising:

a base having multiple tubular base extensions secured to a rectangular bottom of the base, each of the base exten-

sions being curved and extending towards a center of the base and having a flattened end overlapping the base bottom;

a top comprising multiple tubular members each tubular member having a flattened end overlapping another top member;

multiple legs, each of the legs extending between one of the base extensions and a tubular member of the top, the legs being spaced inwardly from the rectangular bottom of the base so that wire may be wrapped around the legs for storage and may be unwrapped from the carrier by rotating the carrier;

connectors having threaded ends joining each of said legs to said top and said tubular base extensions, each of the legs being removably secured to the base and top of the carrier;

wherein the legs, top and base may be separated from each by removing the connectors.

2. The carrier of claim **1** wherein the legs are tubular.

3. The carrier of claim **1** wherein the legs are straight and tubular.

4. The carrier of claim **1** wherein the carrier has four legs and eight connectors.

5. The carrier of claim **1** wherein the top comprises four tubular members.

6. The carrier of claim **5** wherein each of the connectors has a first threaded end adapted to engage a threaded opening in one of the legs and a second threaded end to engage a threaded opening in one of the base and top.

7. The carrier of claim **1** wherein the openings are circular.

8. The carrier of claim **1** wherein the base has a rectangular bottom portion made of multiple tubular members.

9. The carrier of claim **1** wherein each of the legs has two openings.

10. A collapsible wire carrier comprising:

a base having a generally rectangular base bottom and a plurality of curved base extensions secured to the base bottom, each of the base extensions being arched upwardly and inwardly and having a threaded opening and a flattened end overlapping the base bottom;

a top comprising multiple members secured together, each of the top members having a downwardly curved portion having a threaded opening and a flattened end overlapping another top member;

multiple straight tubular legs, each of the legs being removably secured to the base and top of the carrier with connectors having threaded ends wherein the collapsible wire carrier may be broken into pieces for ease of transportation and wherein the legs are spaced inwardly from the base bottom such that wire may be wrapped around the legs for storage without falling off the base bottom.

11. The carrier of claim **10** wherein each of the connectors is engaged with a threaded opening in one of the base extensions and top members and one of the legs.

12. The carrier of claim **11** wherein the top comprises four tubular members welded together.

13. The carrier of claim **10** wherein the carrier has four legs and eight connectors.

14. The carrier of claim **10** wherein the carrier has at least three legs.

15. A collapsible wire carrier comprising:

a base having a generally rectangular base bottom and four curved base extensions secured to the base bottom, each of the base extensions being arched upwardly and inwardly and having a threaded opening and a flattened end overlapping the base bottom;

a top comprising four curved members welded together, each of the top members having a downwardly curved portion having a threaded opening therein and a flattened end overlapping another top member;

four straight legs spaced inwardly from the base bottom such that wire may be wrapped around the legs for storage without falling off the base and may be unwrapped by rotating the carrier, each of the legs having threaded openings therein;

eight connectors joining the legs to the base extensions and top members,

each of the connectors have threaded ends, one of the threaded ends extending into one of the threaded openings in one of the base extensions and top members and the other threaded end extending into one of the threaded openings in one of the legs wherein the legs may be separated from the top and base for shipping the wire carrier by separating the connectors from the top and base and legs.

16. The carrier of claim **15** wherein each of the base extensions is welded to the base bottom.

17. The carrier of claim **16** wherein each of the legs fits into one of the base extensions.

18. The carrier of claim **15** wherein each of the legs is tubular.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO. : 9,120,640 B2
APPLICATION NO. : 13/721220
DATED : September 1, 2015
INVENTOR(S) : Mark J. Janosik et al.

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

IN THE SPECIFICATION

Column 4

Line 54, the "." at the beginning of the line should be after "32a" in the previous line.

IN THE CLAIMS

Column 5

Line 17, after "each", insert the word --other--.

Line 30, "claim 1" should be ---claim 6---.

Signed and Sealed this
Sixteenth Day of February, 2016

Michelle K. Lee

Michelle K. Lee
Director of the United States Patent and Trademark Office